

MAYOR & COUNCIL AGENDA COVER SHEET

MEETING DATE:

October 11, 2004

CALL TO PODIUM:

Mark DePoe

RESPONSIBLE STAFF:

Mark DePoe,
Long Range Planning Director

AGENDA ITEM:

(please check one)

	Presentation
	Proclamation/Certificate
	Appointment
	Public Hearing
	Historic District
	Consent Item
	Ordinance
	Resolution
	Policy Discussion
X	Work Session Discussion Item
	Other:

PUBLIC HEARING HISTORY:

(Please complete this section if agenda item is a public hearing)

Introduced	
Advertised	
Hearing Date	
Record Held Open	
Policy Discussion	

TITLE: Work Session Discussion**I-270/US 15 Multi-Modal Corridor Study****SUPPORTING BACKGROUND:**

The purpose of the I-270/US 15 Multi-Modal Corridor Study is to investigate options to address congestion and improve safety conditions along the I-270/US 15 Corridor. The limits for this study extend from I-370 in Montgomery County to US 15 at Biggs Ford Road in Frederick County. The I-270/US 15 Corridor provides an essential connection between the Washington, DC metropolitan area and both central and western Maryland and is an important corridor for carrying local and long distance trips, both within and beyond the Corridor.

The I-270/US 15 Corridor is currently served by a variety of transportation modes (including interstate highway, high-occupancy vehicle lanes, commuter rail, and bus service) and intermodal opportunities (including park and ride lots and Metrorail). However, even with the variety of modal options available, the Corridor is highly congested at many locations within the project area. These problems are expected to become more severe as continued growth in population and employment occur over the next quarter century. The major factors affecting commuter travel through the project area are the 19% increase in population in Montgomery County and the 50% increase in population in Frederick County expected between 2000 and 2025.

To answer the purpose of this study several combinations of highway and transit strategies are being evaluated. These include general-purpose lanes, auxiliary lanes, high occupancy vehicle (HOV) lanes, express toll lanes (ETL), collector-distributor (C-D) lanes, Light Rail Transit (LRT), Bus Rapid Transit (BRT), and Premium Bus alternates.

Due to the possible impacts of the recommended improvements to I-270, as they relate to the City of Gaithersburg, the City has asked Michael Perrotta, of State Highway Administration, to give a presentation. The purpose of this presentation is to illustrate aspects of the project and how they relate to Gaithersburg as well as providing project status. Following the presentation, Mr. Perrotta will be available for questions. Staff, at this time, has not received the presentation.

Attached:

Draft Environmental Impact Statement (DEIS) I-270/US 15 Multi-Modal Corridor Study Summary

DESIRED OUTCOME:

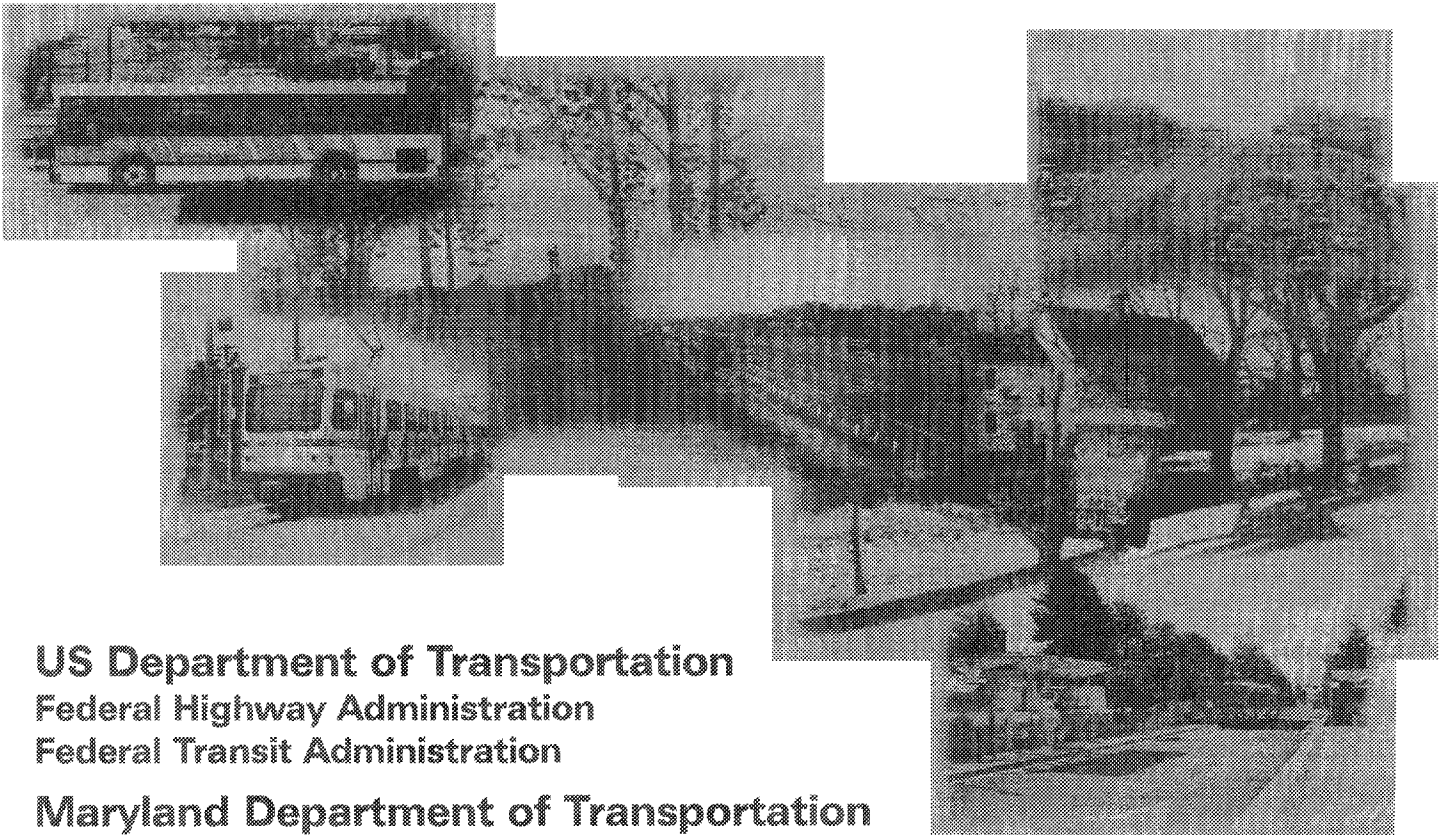
Obtain Understanding of the I-270/US 15 Multi-Modal Corridor Study.



Multi-Modal Corridor Study

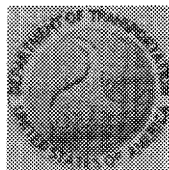
Frederick and Montgomery Counties, Maryland

Draft Environmental Impact Statement and Section 4(f) Evaluation



US Department of Transportation
Federal Highway Administration
Federal Transit Administration

Maryland Department of Transportation
State Highway Administration
Maryland Transit Administration



SUMMARY

A. ADMINISTRATIVE ACTION

- (X) Draft Environmental Impact Statement
- () Environmental Assessment
- (X) Section 4(f) Evaluation

B. INFORMATIONAL CONTACTS

Additional information concerning this project may be obtained by contacting:

Ms. Cynthia Simpson

Deputy Director
Office of Planning and Preliminary Engineering
State Highway Administration
707 North Calvert Street, Mail Stop C-301
Baltimore, Maryland 21202
Hours: 7:30 AM to 4:30 PM, Mon.-Fri.
Phone: (410) 545-8500

Ms. Diane Ratcliff

Manager, Environmental Planning
Office of Planning
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D. DESCRIPTION OF ACTION/ PURPOSE AND NEED

The I-270/US 15 Corridor is a vital component of the surface transportation system in the Metropolitan Washington region and includes portions of I-270, US 15, and US 40 in Montgomery and Frederick Counties (Refer to **Chapter I, Figure I-4**). Interstate 270, which begins at the Capital Beltway (I-495) and ends at I-70 in Frederick, provides one of the two interstate highway connections between the nation's capital and points west (the other connection is I-66 in Virginia) and north. As an interstate highway, I-270 is a fully access-controlled facility with a variable number of lanes ranging from four to twelve. In Maryland, US 15 extends from the Virginia state line near Point of Rocks to the Pennsylvania state line near Emmitsburg, and

provides a major north-south route located between the interstate corridors of I-81 to the west and I-83/I-95 to the east. US 15 provides an important crossing of the Potomac River as well. Throughout most of its approximate 30-mile length in Maryland, US 15 is a multi-lane highway, with varying degrees of access control.

The purpose of the I-270/US 15 Multi-Modal Corridor Study is to investigate options to address congestion and improve safety conditions along the I-270/US 15 Corridor. The limits for this study extend from I-370 in Montgomery County to US 15 at Biggs Ford Road in Frederick County. The I-270/US 15 Corridor provides an essential connection between the Washington, DC metropolitan area and both central and western Maryland and is an important corridor for carrying local and long distance trips, both within and beyond the Corridor (Refer to **Chapter I, Figure I-1**). The I-270/US 15 Corridor is currently served by a variety of transportation modes (including interstate highway, high-occupancy vehicle lanes, commuter rail, and bus service) and intermodal opportunities (including park and ride lots and Metrorail). However, even with the variety of modal options available, the Corridor is highly congested at many locations within the project area. These problems are expected to become more severe as continued growth in population and employment occur over the next quarter century.

The major factors affecting commuter travel through the project area are the 19% increase in population in Montgomery County and the 50% increase in population in Frederick County expected between 2000 and 2025. Even with the transportation improvements underway or planned, future development that is expected as a response to the increases in population and employment will cause increased congestion.

E. ALTERNATES CONSIDERED

Several combinations of highway and transit strategies are evaluated, including general-purpose lanes, auxiliary lanes, high occupancy vehicle (HOV) lanes, collector-distributor (C-D) lanes, Light Rail Transit (LRT), Bus Rapid Transit (BRT), and Premium Bus alternates. The specific alternatives under consideration are summarized below and described in detail in **Section II.C**.

1. Alternate 1: No-Build Alternate

The No-Build Alternate provides a foundation for comparing all of the other alternates. The No-Build Alternate reflects current and programmed conditions within the I-270/US 15 Corridor and consists of the elements adopted from the 2000 Constrained Long Range Transportation Plan. However, the construction of a southbound HOV lane between MD 121 and I-370 is excluded from the No-Build Alternate because it is included in several of the alternates under consideration. Under the No-Build Alternate, no major capacity improvements would be made on I-270 or US 15. Only routine maintenance and spot improvements are included.

2. Alternate 2: Transportation System Management (TSM)/ Transportation Demand Management (TDM) Alternate

The TSM/TDM Alternate includes a number of relatively low cost measures meant to improve the overall operation of the existing transportation facilities but they do not address the need for capacity improvements. Under the TSM/TDM Alternate, no major capacity improvements would be made on I-270 or US 15. The TSM measures included in this alternate are:

- Increase and improve existing bus service in the Corridor.
- Integrate the bus service improvements with enhanced feeder and distributor service.
- Enhance feeder bus service to Metro and MARC stations.
- Provide interactive transit information at major employment centers in the Corridor.

The TDM measures included in this alternate are:

- Additional park and ride spaces or lots.
- Enhanced rideshare program in the project area, including interactive ride matching at major employment centers and implementation of a regional Guaranteed Ride Home program.
- Comprehensive vanpool program in the project area, including financial start-up assistance, increased vanpool eligibility for Metrocheck, a consolidated matching database and establishment of a vanpool loaner program.
- Improved pedestrian access to the Shady Grove Metro station and to the MARC stations in the project area.
- Completion of specific components of the Metropolitan Washington Council of Governments (MWCOG) Constrained Long Range Plan Bicycle Element, such as constructing specific critical segments of the MWCOG Bicycle Element to provide for a fully linked system in the Corridor.
- Improved regional telecommuting program.
- Encouragement of flexible work hours.

3. Build Alternates

- a. Alternate 3A: Master Plan HOV/LRT Alternate**
Alternate 3B: Master Plan HOV/BRT Alternate

Alternates 3A/B consist of a TSM/TDM component; a highway component with general-purpose lanes, HOV lanes, C-D lanes, new interchanges, and improvements to existing interchanges; and a transit component of either LRT (3A) or BRT (3B) on the CCT alignment. Refer to **Chapter II, Figure II-1** for a description of the Build Alternates.

TSM/TDM Component

The TSM/TDM component is the same as described in **Section S.E.2**.

Highway Component

Alternates 3A/B consist of adding general-purpose lanes, HOV lanes, auxiliary lanes, C-D lanes and direct access ramps to I-270 and adding general-purpose and auxiliary lanes to US 15. Only one additional lane is being considered on I-270 between MD 121 and I-70 and this additional lane will be evaluated as an HOV lane in Alternates 3A/B. The highway component of Alternates 3A/B are described below.

General-Purpose, HOV, and Auxiliary Lane Additions

- **I-370 to Middlebrook Road** - Convert the existing I-270 southbound inside general-purpose lane to an HOV lane, see **Volume 2 of 2, Chapter XI, plan sheets HWY 1, HWY 2 and HWY 3.**
- **Middlebrook Road to Father Hurley Boulevard** – Convert the existing southbound inside general-purpose lane to an HOV lane and add an additional general-purpose lane to the outside to replace the converted lane. Between MD 118 and Father Hurley Boulevard, the northbound HOV lane would be converted to a general-purpose lane and a new HOV lane would be added through inside widening, see **Volume 2 of 2, Chapter XI, plan sheets HWY 3 and HWY 4.**
- **Father Hurley Boulevard to MD 121** – Convert the northbound HOV lane to a general-purpose lane; add a new HOV lane to the inside in both the northbound and southbound directions; and add an additional general-purpose lane through outside widening in both the northbound and southbound directions, see **Volume 2 of 2, Chapter XI, plan sheets HWY 4 and HWY 5.**
- **MD 121 to MD 85** – Add an HOV lane to the inside in both the northbound and southbound directions, see **Volume 2 of 2, Chapter XI, plan sheets HWY 5 through HWY 11.**
- **MD 85 to I-70** – Add an HOV lane to the inside in both the northbound and southbound directions and add an auxiliary lane between the interchange acceleration/deceleration ramps to the outside in the southbound direction. In addition, improvements would be made along I-270 northbound as part of the proposed MD 85 interchange improvements, see **Volume 2 of 2, Chapter XI, plan sheet HWY 11.**
- **I-70 to US 15/US 340/Jefferson Street** – Add one additional northbound and southbound general-purpose lane through inside widening, see **Volume 2 of 2, Chapter XI, plan sheets HWY 11 and HWY 12.**
- **US 15/US 340/Jefferson Street to MD 26** – In both the northbound and southbound directions, add one general-purpose lane to the inside and one auxiliary lane connecting interchange acceleration/deceleration ramps (not a continuous outside lane) to the outside, see **Volume 2 of 2, Chapter XI, plan sheets HWY 12 through HWY 14.**

- **MD 26 to Trading Lane** - Add one general-purpose lane in both the northbound and southbound directions through outside widening, see **Volume 2 of 2, Chapter XI, plan sheet HWY 14**.
- **Trading Lane to Biggs Ford Road** - Add one general-purpose lane through inside widening in the northbound and southbound directions, see **Volume 2 of 2, Chapter XI, plan sheets HWY 14 and HWY 15**.

Collector-Distributor Lanes

C-D lanes are local lanes that run parallel to the highway, carry traffic merging on and off of the freeway, (referred to as mainline lanes), and are separated from the mainline lanes by a barrier. Slip ramps accommodate the traffic between the mainline and C-D lanes. In Alternates 3A/B, the C-D lanes that begin at I-370 (southbound) and end at MD 124 (northbound) will be extended to Father Hurley Boulevard, see **Volume 2 of 2, Chapter XI, plan sheets HWY 1 through HWY 4**.

Direct Access Ramps

HOV only direct access ramps are being considered at the proposed Newcut Road and Watkins Mill Road interchanges to facilitate movements to the existing and proposed transit stations at COMSAT and Metropolitan Grove, respectively (see **Volume 2 of 2, Chapter XI, plan sheet HWY 5**). At the Newcut Road interchange, direct access ramps are located in the median of the freeway to provide access to the interchange directly from the I-270 HOV lane. Direct access ramps at the Watkins Mill Road interchange will be developed based on further federal, state, and local coordination, with a potential option for the direct access ramps located between existing MD 124 and proposed Watkins Mill Road, as an extension of Metropolitan Grove Road.

The direct access ramps being considered would provide on and off access from both directions of the highway via one lane to the center of the interchange bridge. The ramps would only be in operation during the peak periods in the peak direction (i.e. from/to I-270 southbound during the AM peak period and from/to I-270 northbound during the PM peak period). Barricades and variable message signs would indicate when the ramps are not in operation.

Both the proposed HOV lanes and direct access ramps will enhance bus service along I-270 to serve employment and residential areas that are not served by the CCT and Metrorail.

Proposed Interchanges

New interchanges at I-270/Newcut Road, I-270/MD 75 Extended, US 15/Trading Lane, and US 15/Biggs Ford Road are proposed as part of Alternates 3A/B, see **Volume 2 of 2, Chapter XI, plan sheets HWY 5, HWY 7, HWY 14 and HWY 15**, respectively.

Interchange Improvements

Improvements to the following interchanges are proposed as part of Alternates 3A/B: I-270/MD 117, I-270/Middlebrook Road, I-270/MD 118, I-270/Father Hurley Boulevard, I-270/MD 121, I-270/MD 109, I-270/MD 80, I-270/MD 85, and Jefferson Street /US 15/US 340.

Transit Component

The proposed transit alignment for Alternates 3A/B is the Corridor Cities Transitway (CCT), see **Volume 2 of 2, Chapter XI, plan sheets TRAN 1 through TRAN 6**. It is approximately 13.5 miles in length and generally runs northwest from the existing Shady Grove Metro Station to the COMSAT facility. The following 18 stations are proposed: Shady Grove, East Gaither, West Gaither, Washingtonian, Crown Farm (Master Plan beyond 2025), DANAC, Decoverly, School Drive, Quince Orchard, NIST, First Field (Master Plan beyond 2025), Metropolitan Grove, Middlebrook (Master Plan beyond 2025), Germantown Center, Cloverleaf, Manekin (Master Plan beyond 2025), Dorsey Mill, and COMSAT. In the future, the CCT may be extended to Frederick. The transit alignment is the same for both Alternates 3A and 3B and the alignment includes a hiker/biker trail. However, the transit mode proposed is different in each alternate.

The transit mode proposed in Alternate 3A is a double-tracked LRT system. Track centers would be spaced approximately 14 feet apart and the overall width of the typical section would generally range between 50 and 75 feet. Implementing LRT along the CCT would require a rail yard associated with maintenance and storage of vehicles. Ridership analysis indicates that this facility must accommodate storage for approximately 50 light rail vehicles. Several locations are currently being considered for the rail yard. These include the Shady Grove Metro Station area, the Metropolitan Grove area, and the COMSAT area.

The transit mode proposed in Alternate 3B is a BRT system. BRT uses buses to emulate the speed, reliability, and image of light rail. Bus service would operate in two general formats: (1) line haul along the CCT and (2) smaller feeder buses which would circulate through neighborhoods before using the busway. The CCT would be a paved roadway used exclusively by buses. The roadway would be constructed with one 12-foot lane in each direction. The overall width of the typical section would range from 45 to 70 feet. Implementing BRT along the CCT alignment would also require a bus yard/shop facility associated with maintenance and storage of vehicles. However, this facility could be located at one of the three areas being considered for the LRT facility (Shady Grove Metro Station, Metropolitan Grove, or COMSAT), or it could be located at another off-line facility. A hiker/biker trail is also proposed along the BRT alignment.

b. Alternate 4A: Master Plan General-Purpose/LRT Alternate Alternate 4B: Master Plan General-Purpose/BRT Alternate

Alternates 4A/B consist of a TSM/TDM component; a highway component with general-purpose lanes, HOV lanes, and C-D lanes, new interchanges, and improvements to existing interchanges; and a transit component of either LRT (4A) or BRT (4B) on the CCT alignment. Refer to **Chapter II, Figure II-1** for a description of the Build Alternates.

TSM/TDM Component

The TSM/TDM component is the same as described in **Section S.E.2**.

Highway Component

The highway component in Alternates 4A/B is the same as the highway component described in Alternates 3A/B except a general-purpose lane instead of an HOV lane would be added to I-270 in both directions between MD 121 and I-70. Between MD 121 and I-70, Alternates 4A/B propose the following:

- **MD 121 to MD 85** – Add a general-purpose lane to the inside in both the northbound and southbound directions, see **Volume 2 of 2, Chapter XI, plan sheets HWY 5 through HWY 11**.
- **MD 85 to I-70** – Add a general-purpose lane to the inside in both the northbound and southbound directions and add an auxiliary lane between the interchange acceleration/deceleration ramps to the outside in the southbound direction. In addition, improvements would be made along I-270 northbound as part of the proposed MD 85 interchange improvements, see **Volume 2 of 2, Chapter XI, plan sheet HWY 11**.

Transit Component

The transit component for Alternates 4A and 4B are the same as the transit component described in Alternates 3A/B, see **Volume 2 of 2, Chapter XI, plan sheets TRAN 1 through TRAN 6**.

- c. **Alternate 5A: Enhanced Master Plan HOV/General-Purpose/LRT Alternate**
Alternate 5B: Enhanced Master Plan HOV/General-Purpose/BRT Alternate
Alternate 5C: Enhanced Master Plan HOV/General-Purpose/Premium Bus Alternate

Alternates 5A/B/C consist of a TSM/TDM component; a highway component with general-purpose lanes, HOV lanes, C-D lanes, new interchanges, and improvements to existing interchanges; and a transit component of either LRT (5A) or BRT (5B) on the CCT alignment, or Premium Bus on the HOV lanes (5C). Refer to **Chapter II, Figure II-1** for a description of the Build Alternates.

TSM/TDM Component

The TSM/TDM component is the same as described in **Section S.E.2**.

Highway Component

General-Purpose, HOV and Auxiliary Lane Additions

The highway component for Alternate 5A/B is the same as described in Alternate 3A/B except along I-270 between MD 121 and I-70. Along this section of I-270, one general-purpose lane would be added in each direction, in addition to the HOV lanes described in Alternate 3A/B.

(The proposed I-270 section between MD 121 and I-70 consists of three general-purpose lanes and one HOV lane in each direction.) Between MD 121 and I-70, Alternates 5A/B are as follows:

- **MD 121 to MD 85** - Between MD 121 and MD 85, an HOV lane would be added to the inside and one general-purpose lane would be added to the outside in both the northbound and southbound directions, see **Volume 2 of 2, Chapter XI, plan sheets HWY 5 through HWY 11**.
- **MD 85 to I-70** - Between MD 85 and I-70, an HOV lane would be added to the inside in both the northbound and southbound directions and one additional general-purpose lane and one auxiliary lane between the interchange acceleration/deceleration ramps would be added to the outside in the southbound direction. In addition, improvements would be made along I-270 northbound as part of the proposed MD 85 interchange improvements, see **Volume 2 of 2, Chapter XI, plan sheet HWY 11**.

The highway component of Alternate 5C is the same as described in Alternates 5A/B, except for the locations of direct access ramps and the northern limit of the HOV lanes.

In Alternate 5C, the HOV lanes described between MD 121 and I-70 in Alternate 5A/B would be terminated at the proposed direct access ramps at the proposed Shockley Drive overpass approximately 0.5 mile south of MD 85. The Alternate 5C highway component between MD 121 and I-70 proposes the following:

- **MD 121 to MD 85** – In both directions, add an HOV lane to the inside and one general-purpose lane to the outside. The HOV lanes would terminate at the proposed direct access ramps at the Shockley Drive overpass approximately 0.5 mile south of MD 85. The Shockley Drive overpass is part of a separate planning study, and is designated as a local roadway in the Frederick County Draft Master Plan, see **Volume 2 of 2, Chapter XI, plan sheets HWY 5 through HWY 11**.
- **MD 85 to I-70** - Add one additional general-purpose lane and one auxiliary lane between the interchange acceleration/deceleration ramps to the outside in the southbound direction. In addition, improvements would be made along I-270 northbound as part of the proposed MD 85 interchange improvements, see **Volume 2 of 2, Chapter XI, plan sheet HWY 11**.

Direct Access Ramps

In addition to the direct access ramps at the Watkins Mill Road and Newcut Road interchanges, direct access ramps are being considered at the I-370, MD 118, and MD 85 (Shockley Drive) interchanges, see **Volume 2 of 2, Chapter XI, plan sheets HWY 1, HWY 3 and HWY 11**, respectively.

The direct access ramps proposed at MD 85 would be located at the proposed Shockley Drive overpass, which is part of a separate planning study. Direct access ramps would be located in the

median of the freeway and would provide access to the interchange directly from the HOV lane. With the exception of the ramps at I-370 and MD 85 (Shockley Drive), the direct access ramps would provide on and off access from both directions of the highway. The direct access ramps at I-370 would only provide access to/from the north. The direct access ramps at MD 85 (Shockley Drive) would only provide access to/from the south. The ramps would provide access via one lane to the center of the interchange bridge, except for I-370 where the ramps would provide access directly to the HOV lanes on I-370. The ramps would only be in operation during the peak period in the peak direction (i.e. to/from I-270 southbound during the AM peak period and to/from I-270 northbound during the PM peak period). Barricades and variable message signs would indicate when the ramps are in operation.

Transit Component

The transit component of Alternates 5A/B/C consists of three alternatives, see **Volume 2 of 2, Chapter XI, plan sheets TRAN 1 through TRAN 6**. Alternates 5A (LRT) and 5B (BRT) are the same as Alternates 3A (LRT) and 3B (BRT), respectively. Alternate 5C proposes implementing premium/limited stop bus service on the proposed HOV lanes instead of operating LRT or BRT on the CCT. Alternate 5C includes HOV direct access ramps to service high occupancy vehicles and buses to access the Shady Grove Metro Station (via I-370), Metropolitan Grove MARC Station (via Watkins Mill Road), Germantown Transit Center (via MD 118), COMSAT (via Newcut Road), and the MARC Monocacy Station (via MD 85/Shockley Drive). Express bus service, which offers non-stop service between origins and destinations, would be provided along the I-270 HOV lanes, as would an extended feeder bus system.

F. SUMMARY OF TRANSPORTATION/MOBILITY IMPACTS

1. Transit Component Impacts

The assessment of transportation impacts represents one of the most critical analytical aspects of this study. It encompasses an assessment of service benefits and impacts under the proposed alternatives, anticipated ridership levels and station impacts.

The effectiveness of transit service is dependent upon several factors including geographic coverage, hours of operation and frequency of service, door-to-door travel times, travel time reliability, number and convenience of transfers required, comfort and safety. A useful indicator of quality of service is travel time savings. Travel time savings indicate the amount of time saved by commuters in taking transit versus driving to their destinations.

Within the transit component, the largest savings of in-vehicle travel time occur as a result of the BRT alternate, which provides more than 30 minutes of potential travel time savings using transit for work trips (89,200). The Premium Bus alternate provides the next highest number of trips that save 30 minutes or more (53,400). For one to 20 minutes of time saved the LRT alternates provide the same order of magnitude of time savings as the BRT and Premium Bus alternates.

A measure of effectiveness of the different alternates is the number of new riders who would not otherwise be attracted to transit. These riders reflect the number of people diverted from auto

usage because the various alternates provide an attractive transit choice in terms of travel time, convenience, and cost.

The LRT alternates are projected to result in 2,800 more transit riders than the TSM/TDM Alternate. The BRT Alternates result in the most new riders (11,400) when compared to the TSM/TDM Alternate, followed by the Premium Bus alternate, which is projected to generate 10,800 new transit riders. While LRT and BRT achieve approximately the same overall ridership, more new riders are generated by the BRT alternate. Furthermore, the Premium Bus alternate generates nearly as many new riders as the BRT alternate.

The forecasted access modes of passengers boarding at the various stations were analyzed as a transportation impact. The highest peak period boardings are typically at those stations that provide large park and ride facilities and feeder bus service. Transit patrons will generally walk to a rail station when the distance does not exceed one-half mile. Beyond a half mile, access is provided either by feeder bus service, automobile to a park and ride facility where the vehicle is parked and the driver and passengers then ride transit, or by automobile to a kiss and ride facility where the transit passenger is dropped off and picked up after their return trip by a motorist.

For the LRT alternate, approximately half of the total passengers are arriving at the stations by auto access. Bus access and walk access make up the other half. Walk access to the Decoverly group is the highest overall, although auto access is the highest mode for that group where 3,500 passengers board. More passengers use the Decoverly area stations than any other. Two-thirds of the passengers boarding at the King Farm area stations walk to those stations, however this group of stations has the lowest number of users, only 800 passengers use those stations during the morning peak period. The most northern group, which includes the COMSAT station, has the highest number patrons who use auto to access transit and the most southern group, which includes King Farm, has the lowest number.

For the BRT alternate, access to stations is almost evenly divided among the three access modes. Again, the most northern area stations, which includes the COMSAT station, has the highest number patrons who use auto to access transit (1,600); the most southern group of stations, which includes King Farm, and the Germantown group have the lowest (200).

The stations for the Premium Bus alternate vary significantly from LRT and BRT. Approximately half of the passengers used autos to access the Premium Bus stations, approximately 30% used bus and 20% walked. The lowest number of passengers arrived at the MD 75 and MD 85 stations at the northern end of the Corridor. Overall, the most passengers used Metropolitan Grove, COMSAT, and Germantown stations, with the majority of the passengers accessing the stations by either auto or bus.

Overall, boardings for MARC commuter rail are highest for No-Build, followed by TSM/TDM, BRT, and LRT, while Premium Bus is the lowest. The Germantown to Gaithersburg stations have the highest boardings for each alternate. The Frederick to Monocacy stations are the only group of stations where LRT is higher than BRT. For Metrorail boardings, Premium Bus was the highest alternate, followed by BRT, LRT, TSM/TDM and No-Build.

2. Roadway Component Impacts

Operations of highway facilities are evaluated using qualitative measures that characterize operational conditions within a traffic stream and their perception by motorists and passengers. Traffic operations are characterized by level of service (LOS). Each LOS is given letter designations, from A to F, with LOS A representing the best operating conditions or free flow conditions with few interactions between vehicles and LOS E representing capacity of the facility. LOS F represents the worst conditions when a facility is being used to its fullest capacity and severe congestion is experienced. LOS is determined using techniques that are continuously being refined by research performed for the Transportation Research Board (TRB). Periodically recommendations for LOS analysis are published by TRB. The freeway analyses performed for this study are based on the Highway Capacity Manual published by TRB in 1998.

The LOS along mainline I-270 and US 15, and at the corridor and ramp terminal intersections, will degrade over the next 25 years. In general, the 2025 No-Build scenario results in LOS E/F conditions along mainline I-270/US 15 and at the corridor and ramp terminal intersections during the AM and PM peak periods.

With the proposed highway improvements (Alternates 3A/B, 4A/B, and 5A/B/C), the Montgomery County mainline and C-D lane sections of I-270 will continue to be congested, operating at LOS E/F conditions during the AM and PM peak periods. The corridor and ramp terminal intersections are expected to operate above capacity.

The Frederick County mainline section of I-270 will also continue to operate at LOS E/F conditions during the 2025 AM and PM peak periods. In general, the section of I-270 between MD 121 and I-70 will operate at LOS E/F conditions regardless of the proposed number of lanes (six lanes in each direction in Alternates 3A/B and 4A/B versus eight lanes in each direction in Alternates 5A/B/C). This is due to the travel demand projections which show that additional capacity improvements made along I-270 result in additional traffic volumes along the corridor. There are some minor improvements in traffic LOS along southbound I-270 in Alternates 4A/B and 5A/B/C versus Alternates 3A/B (LOS E versus LOS F, respectively) due to these alternates having three general-purpose lanes in each direction, while Alternates 3A/B have only two general-purpose lanes in each direction (note that Alternates 5A/B/C also have an additional HOV lane in each direction).

The general trend along US 15 through the City of Frederick is that traffic conditions will improve over the No-Build conditions with the proposed build alternates and will be consistent with the existing traffic conditions. All three of the build alternates yield similar results along US 15 due to the fact that the proposed alternates are identical in this segment.

The overall traffic analyses show that I-270 and US 15 will continue to be congested (with the proposed build alternates) to 2025 and beyond due to the existing and projected growth along the corridor. However, the build alternates do provide congestion relief in that projected traffic operations would be worse with the No-Build conditions. For instance, reviewing the difference in mainline segment miles that operate under LOS F between the build alternatives and No-Build conditions illustrates this congestion relief, as indicated in **Table S-1**:

TABLE S-1
I-270/US 15 LEVEL OF SERVICE IMPROVEMENTS

	Alternates 1 & 2 (No-Build & TSM/TDM)	Alternates 3A/B	Alternates 4A/B	Alternates 5A/B/C
Year 2025 Mainline Segment Mileage of LOS F Conditions ¹				
I-270/US 15 Northbound (PM Peak Hour)	25	18	14	18
I-270/US 15 Southbound (AM Peak Hour)	25	21	13	14
Total Mileage of LOS F Segments	50	39	27	32
Year 2025 Mileage Reduction of LOS F Segments from No-Build and TSM/TDM Alternates				
I-270/US 15 Northbound (PM Peak Hour)	N/A	7	11	7
I-270/US 15 Southbound (AM Peak Hour)	N/A	4	12	11
Total Mileage Reduction of LOS F Segments	N/A	11	23	18

Note: 1. Total I-270/US 15 corridor length is approximately 31 miles.

Alternates 3A/B would provide an eleven mile total reduction in the mainline segments operating at LOS F (seven miles reduction northbound, four miles reduction southbound). Alternates 4A/B would provide a 23 mile total reduction in the mainline segments operating at LOS F (eleven miles reduction northbound, twelve miles reduction southbound). Alternates 5A/B/C would provide an 18 mile total reduction in the mainline segments operating at LOS F (seven miles reduction northbound, eleven miles reduction southbound). Therefore, Alternates 4A/B offer the greatest reduction in miles of LOS F along the corridor, Alternates 5A/B/C offer the second most reduction, and Alternates 3A/B offer the least amount of congestion relief compared to the expected No-Build conditions.

G. SUMMARY OF ENVIRONMENTAL IMPACTS AND PERMITS REQUIRED

A summary of the impacts associated with the alternates under consideration is presented in this section and in **Table S-2**.

**TABLE S-2
SUMMARY OF IMPACTS**

Resources	Alternate 1 No-Build	Alternate 2 TSM/TDM	Alternate 3A LRT	Alternate 3B BRT	Alternate 4A LRT	Alternate 4B BRT	Alternate 5A LRT	Alternate 5B BRT	Alternate 5C Premium Bus
Right-of-way Required (Acres)									
Highway	0	0	374	374	374	374	404	428	428
Park-and-Ride Lots	0	18	18	18	18	18	18	18	18
Transitway ¹	0	0	170 ¹	170 ¹	170 ¹	170 ¹	170 ¹	170 ¹	0
Total	0	18	562	562	562	562	592	592	446
Residential Displacements	0	0	64-127				64-128		127-385
Business Displacements	0	0	4-11				4-12		2-11
Number of Farmlands Affected	0	0	30				30		27
Farmlands Required (Acres)	0	6	133				143		106
Number of Public Parks Affected	0	0	11				12		13
Public Park Property Required (Acres)	0	0	37				44		48
Number of Historic Sites Impacted	0	0	7				7		5
Linear feet of Streams Impacted	0	0	14,185				16,331		13,407
100-Year Floodplains Required (Acres)	0	3	23				24		21
Wetlands Impacted (Acres)	0	0.5	10.7				11.6		10.7
Forests Impacted (Acres)	0	0	183				199		180
Hazardous Materials (Number of Properties Affected)	0	0	6	4	6	4	6	4	4
RTE Species Affected	0	0	0				0		0
Number of Air Quality Receptors with CO Violations	0	0	0				0		0
Number of Noise Monitoring/Modeling Locations Exceeding Abatement Criteria ²	33		52 ²				51 ²		35
Consistent With Area Land Use Plans (Yes/No)	No	No	Yes				No		No
Capital Costs (Millions of 2001 Dollars)	0	\$33	\$2,662	\$2,597	\$2,662	\$2,597	\$2,955	\$2,890	\$2,519

Notes: 1. Transitway right-of-way impacts do not include a yard/shop facility.
2. Includes noise monitoring/modeling locations along the transitway alignment; includes transit horn noise impacts.

1. Socioeconomic

The No-Build Alternate will not directly affect community facilities and services. However, the No-Build Alternate does not address the need for additional capacity or enhanced mobility and will exacerbate traffic congestion and safety hazards along I-270 that will occur with the planned growth in the Corridor. This increased traffic congestion will adversely impact school bus safety and emergency response times. The TSM/TDM Alternate, which will improve the efficiency of existing roadways, is not expected to have a direct impact on existing community facilities and services. All of the build alternates would, to varying degrees, improve overall access and mobility in the project area. Both the transit and highway components will have various impacts on existing community facilities and services.

No right-of-way acquisition is required for the No-Build Alternate. Approximately 18 acres will be required for the TSM/TDM Alternate due to the preliminary park and ride lot concepts at MD 26, Trading Lane and Biggs Ford Road. Between 446 and 592 acres of right-of-way acquisition will be required for the build alternates. The transitway components of the build alternates will have eight residential and business displacements. The highway components will result in approximately 64 to 385 residential displacements along I-270 depending upon the proposed alternate and the use of retaining walls. Up to twelve businesses will be displaced. Additional detail on residential and business displacements are presented in **Section III.B.1.e**.

The Brighton West, Deer Park Place, London Derry, and Fox Chapel/Middlebrook Hill communities are located in census tracts that exhibit higher proportions of minority and/or low-income populations than the total project area. These communities may experience disproportionately high or adverse impacts due to a substantial number of displacements under the highway component of the build alternates. However, the proposed direct access ramps at the I-370 interchange have been identified as a non-preferred alternate due to the number of residential displacements associated with these ramps (see Non-Preferred Alternates discussion in **Section S.I**, Issues to be Resolved and **Section III.V.E**, Trade-Off Analysis). The project team will continue to confirm and refine the locations of minority and low-income populations during subsequent stages of the project. Efforts to inform these populations and involve them in the project planning process will continue. Should a build alternate be selected that impacts these populations, the project team will develop potential mitigation measures in consultation with the affected communities. Other communities within census tracts exhibiting higher proportions of minority and/or low-income populations than the project area will not incur “disproportionately high or adverse impacts” as a result of the proposed transportation improvements. Right-of-way, noise, and visual impacts for these census tracts are comparable to other locations throughout the project area. Where possible, providing noise barriers can mitigate potential noise impacts and visual impacts can be mitigated using the measures described above. Additional environmental justice analysis appears in **Section III.B.2**.

Numerous publicly owned parks and recreation areas are located in the project area. Up to 48 acres of property to be acquired from the following 13 parks and recreational areas: Morris Park (Alternate 5C only), Malcolm King Park, Seneca Creek State Park, Middlebrook Hill Park, North Germantown Greenway/Little Seneca Greenway, Black Hill Regional Park, Little Bennett Regional Park, Urbana Lake Fish Management Area, Urbana Elementary School, Urbana

Community Park, Monocacy National Battlefield (a National Historic Landmark), Baker Park, and Rose Hill Manor Historic Park. A more detailed analysis of impacts to parks and recreational facilities, including a discussion of efforts to avoid, minimize and mitigate adverse impacts can be found in **Chapter VI**, Section 4(f) Evaluation.

Because there are many known archaeological sites within the project area, the project area is considered likely to have high historic and archaeological potential. The Maryland SHPO has concurred that 31 historic sites and districts within the project's area of potential effect are on or eligible for inclusion on the NRHP. Of the 31 historic sites, the alternates will have either an adverse or no adverse effect on up to seven sites: England/Crown Farm (M 20/17), Belward Farm (M 20/21), Monocacy National Battlefield (F 3/42), Schifferstadt (F 3/47), Rose Hill Manor (F 3/126), Spring Bank (F 3/22), and Birely-Roelkey Farmstead (F 3/134). Further coordination with the Maryland Historical Trust (MHT) is ongoing (refer to letters in **Chapter VII**) to determine the extent of effects to cultural resources, including historic standing structures and archaeological resources.

Phase I archaeological identification investigations were conducted for the mainline improvements for the project in 1999. The survey resulted in the identification of seven prehistoric archaeological sites and one historic archaeological site. Five previously identified prehistoric sites and two previously identified historic sites were reinvestigated. None of the newly identified sites were considered significant by virtue of their low research potential and lack of integrity. Sufficient testing was conducted at the reinvestigated sites to confirm their low research potential and lack of integrity. The MHT concurred with these findings in a letter dated November 5, 1999 and agreed that no additional archaeological investigations were warranted for the project. The National Park Service has also commented on the results of the previous archaeological identification investigations conducted within the Monocacy National Battlefield and had concurred in 1999 that no additional work is required. SHA is completing consultation with the State Historic Preservation Officer regarding project effects to historic properties including resolution of an adverse effect through development of a draft Memorandum of Agreement.

2. Natural Environment

The build alternates will impact up to 291 acres of prime farmland soils and up to 392 acres of soils of statewide importance. Coordination is being completed with the Natural Resources Conservation Service (NRCS) offices of Frederick and Montgomery Counties.

Streams in the project area are Class I, Class III, and Class IV, and may require time-of-year restrictions from March 1 through June 15 (Class I), from March 1 through May 31 (Class IV), and from October 1 through April 30 (Class III) for any in-stream construction. Major streams included in the project area from south to north are: Muddy Branch, Long Draught Branch, Great Seneca Creek, Gunner's Branch, Little Seneca Creek, Cabin Branch, Tenmile Creek, Little Bennett Creek, Bennett Creek, the Monocacy River, Rock Creek, Carroll Creek, and Tuscarora Creek. The transitway alignment will impact approximately 2,940 linear feet of streams, and the proposed highway improvements will impact approximately 11,245 linear feet to 13,407 linear feet of streams.

Numerous non-tidal high quality wetlands are located throughout the project area. Degree of impact on the wetland varies by alternate. There are no impacts to wetlands associated with the No-Build Alternate. Between 10.7 and 11.6 acres of wetlands will be disturbed by the build alternates. An agency field verification of potential wetland areas for proposed park and ride lot sites at Trading Lane and Biggs Ford Road has not been conducted. There were no wetlands or waterways present within the proposed park and ride lots at MD 26 as determined during the field review in August 2001. Most of the transit station and yard/shop facilities have been field verified for the presence of wetlands and waterways, in comparison to the DNR wetland maps. Potential wetlands and waterways in the vicinity of the transit stations at COMSAT, Decoverly, Metropolitan Grove Station, Quince Orchard, and the National Institute of Standards and Technology have yet to be field verified with the agencies.

Germantown Bog is a Wetland of Special State Concern (WOSSC) and has been specially designated by the State of Maryland as deserving of special protections due to its ecological significance. The build alternates will not directly impact Germantown Bog, which lies approximately 400 feet east of the project area. However, the alternates will impact Wetland 57E, which is hydrologically connected to the Germantown Bog by a tributary. Wetland 57E has been previously disturbed from the construction of a road crossing with a culvert and fill slope. Coordination with the MDE and the DNR Wildlife and Heritage Division will be required to determine the extent of the impact and determine whether the impact would diminish the ecological significance of the wetland.

The Maryland Piedmont Sole Source Aquifer traverses I-270 between MD 80 (Urbana) and MD 118 (Germantown). This aquifer is a source of well water supply for most of Montgomery County. The U.S. Environmental Protection Agency (EPA) will assess effects in terms of the amount of new paved areas that will reduce the total area of groundwater recharge for the aquifer as well as the potential for measurable contamination to individual wells by infiltration of roadway runoff. Coordination with appropriate agencies including the EPA regarding the creation of additional impervious surfaces and development of stormwater management facilities will be undertaken.

Project alternates are configured so that substantial longitudinal floodplain encroachments will not occur. The majority of floodplain encroachments will be from transverse crossings for each of the build alternates (encroachment from roadway development that crosses the valley widths of floodplains). There are no floodplain impacts for the No-Build Alternate. Approximately, three (3) acres of floodplains will be affected by the construction of the Trading Lane park and ride lot in the TSM/TDM Alternate. Floodplain impact on 100-year floodplains for the build alternates varies between approximately 21 acres and 24 acres.

Impacts to terrestrial forests with the highway component range from 156 acres to 180 acres depending on the alternate. The transitway component will impact 27 acres of terrestrial forests. The largest contiguous forested areas (50 acres or more) provide habitat for Forest Interior Dwelling Birds, and the Maryland Department of Natural Resources has previously requested that those areas be protected and addressed in project development plans. Regulations regarding reforestation will be followed to mitigate any unavoidable impacts.

Coordination with the Maryland Department of Natural Resources and the US Fish and Wildlife Service indicates that there are no known federal or state threatened or endangered plant or wildlife species in the project area.

3. Air Quality

The project is not predicted to cause or exacerbate a violation of the applicable National Ambient Air Quality Standards (NAAQS). The project will not have a meaningful impact on regional pollutant burdens.

4. Noise and Vibration

Highway Component Impacts

Future predicted 2025 build noise levels under both highway alternates 3B and 5A exceed the 66 dBA SHA Noise Abatement Criteria at 36 and 35 noise monitoring/modeling locations, respectively. Future No-Build and build noise levels exceed 66 dBA at 26 residential noise monitoring/modeling locations scattered throughout the study area. Noise impacts also occur at parkland locations abutting the corridor, including the Monocacy National Battlefield.

Transitway Component Impacts

Noise impacts were determined at 18 transitway sites, by applying the FTA guidelines contained in *Transit Noise and Vibration Impact Assessment* (FTA, April 1995). The results of the noise analysis show noise impacts that were identified for the LRT alternate under two different scenarios: a) without the train horn and b) with the train horn. An impact assessment was also performed by applying the APTA guidelines and WMATA criteria, both of which specify maximum allowable limits for single pass-by train noise levels (L_{max}) at sensitive land uses along the corridor.

Under the build alternate, 10 noise monitoring/modeling locations would be affected without the train horn and 16 sites would be affected with the train horn. Of the 10 locations under the “without train horn” category nine sites would be categorized as “impacts” and one site would be categorized as “severe impact.” Of the 16 locations under the “with train horn” category four sites would be categorized as “impacts” and 12 sites would be categorized as “severe impacts.” For purposes of comparison, the results of the impact analysis performed by applying the APTA guidelines and WMATA criteria show noise impacts at five sites and no impacts at the remaining 13 locations. Noise levels generated by the proposed BRT traveling along the transitway corridor will generally produce noise levels which are lower than those caused by the LRT option.

Projected vibration levels throughout the transit corridor stay below impact threshold. Commuter buses are not heavy enough to cause any perceptible ground-borne vibration. Vibration levels generated by buses will be lower than those reported under the LRT option.

5. Permits Required

Construction of this project would require review and approval for the following permits:

<u>Permit Required</u>	<u>Permitting Agency</u>
Section 401 Water Quality Certificate	MDE
Section 404 Wetland Permit	USACOE/MDE
Non-tidal Wetland and Waterways Permit	MDE
Stormwater Management Plan Approval	MDE
Sediment and Erosion Control Plan Approval	MDE
National Pollution Discharge Elimination System (NPDES) permit for point discharges	MDE

H. GOALS/OBJECTIVES/MEASURES OF EFFECTIVENESS (MOE)

Goals, Objectives, and Measures of Effectiveness (MOE) were established over the course of the study for purposes of evaluating the proposed alternates. The alternates can be evaluated based on the measures. The measures of effectiveness are presented in **Chapter V**, and the goals are presented below.

Goal 1: Support Orderly Economic Growth

Support the orderly economic development of the I-270/US 15 Corridor consistent with the existing local government land use plans and the State's Smart Growth Policies.

Goal 2: Enhance Mobility

Provide enhanced traveler mobility through the I-270/US 15 Corridor.

Goal 3: Improve Goods Movement

Facilitate the movement of goods within and through the I-270/US 15 Corridor and improve the delivery of services in support of the regional and local economies.

Goal 4: Preserve the Environment

Deliver transportation services in a manner that preserves, protects, and enhances the quality of life and natural environment in the I-270/US 15 Corridor.

Goal 5: Optimize Public Investment

Provide a transportation system in the I-270/US 15 Corridor that makes optimal use of the existing transportation infrastructure while making cost effective investments in facilities and services that support other project goals.

I. SUMMARY OF COSTS AND FINANCIAL ANALYSIS

A summary of the capital and operating cost estimates for each build alternate is found in **Table S-3**. The costs for the build alternates range between \$33 million (Alternate 2) and \$2,955 million (Alternate 5A). These estimates are total project costs including project planning, engineering, right-of-way and construction.

TABLE S-3
CAPITAL COST ESTIMATES
FOR ALTERNATES (MILLIONS OF 2001 DOLLARS)

Cost Component	Alternate 2	Alternate 3A	Alternate 3B	Alternate 4A	Alternate 4B	Alternate 5A	Alternate 5B	Alternate 5C
<i>Highway Capital Costs</i>								
Project Planning	-	\$9	\$9	\$9	\$9	\$9	\$9	\$9
Preliminary Engineering	-	\$216	\$216	\$216	\$216	\$255	\$255	\$271
Right-of-Way	-	\$139	\$139	\$139	\$139	\$139	\$139	\$139
Construction	-	\$1,441	\$1,441	\$1,441	\$1,441	\$1,695	\$1,695	\$1,804
Subtotal Highway	-	\$1,805	\$1,805	\$1,805	\$1,805	\$2,098	\$2,098	\$2,223
<i>Transit Capital Costs</i>								
Subtotal Transit	\$33	\$857	\$792	\$857	\$792	\$857	\$792	\$296
Total Cost of Alternate	\$33	\$2,662	\$2,597	\$2,662	\$2,597	\$2,955	\$2,890	\$2,519

Note: Based on the Maryland Department of Transportation's 2003 to 2008 Consolidated Transportation Program cost estimate.

Source: Rummel, Klepper & Kahl, LLP, March 2002 (Highway Capital Costs) and Parsons, Brinckerhoff, Quade & Douglas, Inc., February 2002 (Transit Capital and O&M Costs).

1. Operating and Maintenance (O&M) Costs

The operations and maintenance (O&M) cost funding strategy is in its formative stages. Highway O&M costs are relatively low; they include routine repairs and periodic road resurfacing. Once the proposed improvements are constructed, it is anticipated that recurring highway O&M costs will be included in the overall repair cycle for the affected segments of I-270/US 15.

It is assumed transit O&M costs for the I-270/US 15 Corridor transit improvements will be met from two sources: system-generated revenues and an operating subsidy. System-generated revenues include passenger fares, advertising revenues and other miscellaneous sources. They are typically not sufficient to meet all O&M costs. The net operating deficit that remains after system-generated revenues are applied to O&M costs must be met from other sources. While federal operating assistance is available, this source is declining. It is assumed that all available federal financial assistance for transit operations will be applied to existing transit operations

within the Washington, DC region and no federal O&M subsidy will be available for the transitway. The O&M subsidy will be provided from state and/or local sources.

The MTA estimates O&M costs for the transitway to be \$25 million per year for the LRT option, \$64 million for the BRT option, and \$32 million for Premium Bus at full system implementation. No decision has been made as to the operating entity for the transitway. That decision, and the development of a detailed financial plan, will be made during subsequent phases of project development.

The estimated O&M costs for the I-270/US 15 highway and transit improvement alternatives are shown in **Table S-4**.

TABLE S-4
PROJECTED I-270/US 15 CORRIDOR O&M COSTS
(MILLIONS OF 2001 DOLLARS)

Alternative		Estimated Annual O&M Costs (\$ Millions)		
		Highway	Transit	Total
Alternate 2	TSM/TDM	-	\$28	\$28
Alternate 3A	Master Plan HOV/LRT	-	\$25	\$25
Alternate 3B	Master Plan HOV/BRT	-	\$64	\$64
Alternate 4A	Master Plan General- Purpose/LRT	-	\$25	\$25
Alternate 4B	Master Plan General-Purpose/BRT	-	\$64	\$64
Alternate 5A	Enhanced MP HOV/General- Purpose/LRT	-	\$25	\$25
Alternate 5B	Enhanced MP HOV/General- Purpose/BRT	-	\$64	\$64
Alternate 5C	Enhanced MP HOV/General- Purpose/Premium Bus	-	\$32	\$32

Source: Parsons, Brinckerhoff, Quade & Douglas, Inc., February 2002 (Transit Capital and O&M Costs).

2. Financial Analysis

A complete discussion of the fiscal impacts of the proposed alternatives can be found in **Section V.F**.

All things considered, the BRT alternates would produce the most positive economic development impacts, followed by the Premium Bus alternate, and finally by the LRT alternates. Within these groups, the alternates that include an additional general-purpose lane between I-70 and MD 121 (either with or without an additional HOV lane) tend to perform slightly better. The final, relative ranking of the alternates, from most to least positive, is:

- Alternates 4B (BRT) and 5B (BRT)
- Alternate 3B (BRT)
- Alternate 5C (Premium Bus)
- Alternates 4A (LRT) and 5A (LRT)
- Alternate 3A (LRT)

3. Cost Effectiveness

This DEIS contains estimates of the total costs and benefits of the I-270/US 15 Multi-Modal Corridor Study. The costs include annualized capital and annual operating costs. The benefits are measured by the additional annual transit patronage attracted and the annual value of travel time savings to existing riders. The cost-effectiveness index includes total capital costs, annual O&M costs, and annual benefits to both existing transit riders and new transit riders. The use of a cost-effectiveness measure allows analysis of added benefits and added costs of the I-270/US 15 Multi-Modal Corridor project as compared to lower cost options such as the TSM/TDM alternative. The cost index is included here because it is used by FTA to rate proposed major capital transportation projects around the country, which are being considered for federal funding.

The cost-effectiveness index for the alternates (**Table S-5**) range from \$5.07 to \$10.94 relative to the No-Build and \$4.16 to \$17.99 relative to the TSM/TDM. The index for the I-270/US 15 Multi-Modal Corridor project is comparable to many projects funded with FTA Section 5309 funds.

TABLE S-5
FTA COST EFFECTIVENESS INDICES AND INPUT VALUES

Alternative	Change in O&M Costs from No-Build (000's)	Change in O&M Costs from TSM/TDM (000's)	Change in Equivalent Annual Capital Costs from No-Build (000's)	Change in EAC from TSM/TDM (000's)	Change in Annual Riders from No-Build (000's)	Change in Annual Riders from TSM/TDM (000's)	C/E Relative to No-Build ¹	C/E Relative to TSM/TDM ¹
TSM/TDM	\$27,800	-	\$4,100	-	5,100	-	-	-
5A LRT	\$24,800	-\$3,000	\$68,400	\$64,300	8,500	3,400	\$10.94	\$17.99
5B BRT	\$63,900	\$36,100	\$65,700	\$61,600	12,400	7,300	\$10.45	\$13.40
5C Premium Bus	\$32,050	\$4,250	\$27,450	\$23,350	11,750	6,650	\$5.07	\$4.16

Note: 1. The lower the cost effectiveness number, the more cost effective the alternate.

J. ISSUES TO BE RESOLVED

The DEIS is one step in a decision making process that may lead to transportation improvements for the I-270/US 15 Corridor. A number of issues will be addressed in subsequent steps or phases of the project:

- Operation of a transit facility
- Potential project construction phasing due to funding constraints
- Coordination with local agencies and developers on specific site locations and designs for stations, parking facilities, noise walls and maintenance facilities
- Minimization of residential and business displacements
- Minimization of impacts to natural resources
- Land Use/ Smart Growth

Non-Preferred Alternates

Due to the potential for significant residential impacts/displacements in two areas along the I-270 Corridor, the Project Team has identified the following items as Non-Preferred Alternates:

- I-270/I-370 Direct Access Ramps (included in Alternate 5C)
- Slope Limits along I-270 Northbound, South of Middlebrook Road along Staleybridge Road (retaining wall to be provided) (included in Alternates 3A/B, 4A/B, 5A/B/C)

I-270/I-370 Direct Access Ramps (included in Alternate 5C)

The proposed direct access ramps at the I-270/I-370 interchange are considered a non-preferred alternate, as the ramps and associated highway widening would result in a substantial number of residential/townhouse unit displacements. If direct access ramps are not provided, this would potentially avoid displacing up to 261 additional residential units, resulting in a potential total of either 91 to 124 displacements (without retaining walls) or 59 to 96 displacements (with retaining walls). The resulting displacements are identical to the impacts in Alternates 5A/B. Elimination of the I-270/I-370 direct access ramps would also potentially avoid up to one additional business displacement.

The elimination of the I-370 direct access ramps would likely reduce the Premium Bus transit ridership in Alternate 5C by approximately 4,000 riders during the AM peak period. This would decrease the total projected 2025 AM peak period ridership from 14,500 to 10,500 riders. In addition, the elimination of these ramps would decrease total corridor transit ridership (MARC commuter rail, local bus, and premium bus) by approximately 800 riders, and would increase traffic volumes in the corridor by approximately 650 additional low occupancy vehicle trips.

Slope Limits along I-270 Northbound, South of Middlebrook Road along Staleybridge Road (included in Alternates 3A/B, 4A/B, 5A/B/C)

Slope limits along I-270 northbound, south of Middlebrook Road are considered a non-preferred alternate, as these slope limits would result in the displacement of a substantial number of single-

family residences. In lieu of slope limits in this area, a retaining wall would be provided along I-270 northbound, south of Middlebrook Road in order to avoid displacements to residences located along Staleybridge Road. Retaining walls in this area would reduce residential impacts from potential displacements of between 26 and 35 residences (total without retaining walls) to between nine and 13 residences

K. RELATED PROJECTS IN THE PROJECT AREA

The Maryland Department of Transportation is engaged in a variety of efforts to find solutions to the I-270/US 15 Corridor's transportation problems. There are a number of other projects ongoing or completed in the project area which are related to the traffic studies in the I-270/US 15 Multi-Modal Corridor Study:

MD 117 Corridor Study: Includes proposed intersection modifications along the MD 117 Corridor. This project is currently in the planning phase. However, much of the MD 117 Corridor will be designed and constructed as part of other studies (listed below). Alternates include auxiliary lanes and an off-street hiker/biker trail.

Congestion Relief Study (CRS): Includes congestion relief along MD 117, centered at the intersection with MD 124. New sidewalks and bikeways are to be included. This project is currently in the design phase and is funded for construction in 2003. In addition, there is an interim project to relieve congestion at the intersection of MD 355 and MD 124. This project is currently under construction.

MD 117 (From I-270 to Muddy Branch Road): Includes improvements to the I-270/MD 117 interchange and along MD 117, as well as the construction of a Park-and-Ride facility. New sidewalks and bikeways are included. The project is currently under construction.

I-270/MD 124 Interchange Modifications: Modifications to the interchange, including the implementation of a park and ride facility. This project was recently completed.

I-270/Watkins Mill Road Extended Study: Improved access (vehicular, pedestrian, bicycle and transit) to and from the transportation network to accommodate and provide sufficient capacity to serve planned economic development in designated growth areas (Priority Funding Areas) of northern Gaithersburg. In addition, it is important to improve access to the Metropolitan Grove MARC Station to facilitate increased transit use. This project planning study was recently completed.

MD 80 Improvements: Developer improvements have been completed at I-270 and MD 80. These improvements have relocated MD 80 between I-270 and MD 355 and widened the road from a two-lane undivided roadway to a four-lane divided roadway. This project also included the reconfiguration of the I-270/MD 80 Park and Ride lot to incorporate both a north and south lot, expanding from 193 spaces to 392 spaces.

MD 85 Study: MD 85, between Spectrum Drive and English Muffin Way is a separate project planning study to evaluate highway widening.

I-270 and I-70 Improvements: Improvements at I-270/I-70 include providing the missing movements from I-270 northbound to I-70 eastbound and I-70 westbound to I-270 southbound, an additional through lane on eastbound and westbound I-70, widening of existing New Design Road to four lanes and widening the existing ramps. This project is currently under construction.

Jefferson Street/US 15/US 340 Interchange Improvements: Includes the construction of left-turn spur ramps off the existing outer ramps in the southeast and northwest quadrants; removal of the northeast and southwest quadrant loop ramps; and reconstruction of the southeast quadrant loop ramp, which has been closed since the early 1990's. Also includes new traffic signals, and lighting/signing modifications. This project is currently under construction.

I-70/MD 355 Interchange: Includes the replacement of the existing eastbound ramps at I-70 to MD 355, reconstruction of MD 85 at the MD 355 intersection, and widening of MD 355 from south of I-70 for approximately 2,500 linear feet. This project is currently under construction.

US 15/MD 26 Interchange Improvements: Ongoing study includes improvements at US 15/MD 26 which are being considered to address the missing movements to-and-from US 15 north and to-and-from the west of the interchange. Improvements would enhance both safety and access (vehicular, pedestrian, bicycle and transit) to and from the transportation network.

MARC Frederick Extension: The Maryland Transit Administration (MTA) extended the Maryland Commuter Rail (MARC) system to provide service from Point of Rocks to Frederick. This project was completed in December 2001.

Separate Transit Studies: Montgomery and Frederick counties have performed separate but coordinated transit easement studies, each of which has identified feasible alternatives for further study. Montgomery County sponsored two studies: the I-270 Corridor Cities Transit Easement Study by the Maryland-National Capital Park and Planning Commission (M-NCPPC), and the Shady Grove/Clarksburg Transitway Study by the Montgomery County Department of Transportation (MCDOT). Frederick County sponsored a study prepared by the M-NCPPC called the I-270 Corridor Cities Transit Easement Study - Frederick County Extension.

L. ENVIRONMENTAL ASSESSMENT FORM

The Environmental Assessment Form (EAF) is a requirement of the Maryland Environmental Policy Act and Maryland Department of Transportation Order 11.01.06.02. Its use is in keeping with the provisions of 1500.4 (k) and 1506.2 and 1506.6 of the Council of Environmental Quality Regulations, effective July 31, 1979, which recommend that duplication of Federal, State and Local procedures be integrated into a single process.

The checklist identifies specific areas of the natural and socioeconomic environment that have been considered while preparing this environmental assessment. The reviewer can refer to the appropriate section of the document, as indicated in the "Comment" column of the form, for a description of specific characteristics of the resource and the potential impacts, beneficial or adverse, that the action may incur. The "No" column indicates that during the scoping and early coordination processes, a specific area of the environment was not identified to be within the project area or would not be impacted by the proposed action